Abstract

This paper reviews findings of research by the author and colleagues on relationships between women’s work and the reproduction of the population. The studies address three questions: (1) How do children affect women’s paid work, and lifetime earnings? (2) How does women’s employment affect the ‘quantity’ of children born? (3) How does women’s employment affect the ‘quality’ of children? - with the focus on Britain. The answers are affected by the woman’s educational attainment. On question 1, childrearing may often halve lifetime earnings, but seldom for the well educated. By contrast, any effects from employment to childbearing, are most apparent in the late motherhood of the well educated. Child quality, as assessed by indicators of their development, benefits from maternal education, and suffers little from maternal employment. The economic advantages for children in dual career families are thus unabated. A widening gulf between mothers will tend to polarise the life-chances of their children, unless there are more options to combine employment and childrearing, especially good quality childcare, for those who cannot afford the market price. Education is a powerful influence, but does not alone solve all issues of equity, between families or between genders.
Acknowledgements

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Production and reproduction are both necessary activities to sustain human society, but it often supposed that for women, participation in advanced economies and the bearing of children are incompatible. The increase in economic opportunities for females has been offered as an explanation of low fertility, and maternal responsibility as an explanation of women’s underachievement compared to men in the sphere of paid work. The objective of this paper is to review the evidence about such incompatibility and its effects on women, childbearing, and children. A novelty of this synthesis is to consider outcomes for children alongside the more familiar theme of female employment and fertility. The story focuses on one country, Great Britain, but allows for differences within it, according to levels of human capital. Such disaggregation is necessary because of the empirical heterogeneity of behaviour, and also because of its implications for the transmission of social inequality across generations. We return to this theme at the end.

Let us first review the theoretical connections between women’s paid work and motherhood. One presumed relationship is an effect of children on women’s earning. That childbearing should reduce a woman’s lifetime earnings has, until recently, been treated as inevitable (Mincer 1962, Davis 1984). Such an effect implies another, on the number of children born, if the prospect of forgoing earnings would tend to discourage women from childbearing. The greater the potential loss, the less likely would a woman be to have many children, if any (Becker 1981, Cigno, 1991, Ermisch 1996). Since education is expected to raise a woman’s earning power, it, too, would increase the earnings opportunity cost of childbearing. Therefore motherhood tends to be deterred, or at least deferred, among more qualified women.
Now consider what the mothers do for children, once they are born. Mothers generally divert time from the labour market, for the valuable purpose of child rearing. ‘New Home Economics’ has coined the phrase ‘home production’ for this unpaid or ‘reproductive’ work. It has also coined ‘child quality’ for one of its outputs. The more human capital, in the form of ability, skill, health, and perhaps social support and contacts, a child obtains, the greater the resulting ‘quality’. It is suggested that, as birth rates fall with economic development, people, particularly the rich, substitute high ‘child quality’ for large families (Becker 1981). Parents’ investment in reproduction does not stop short at bringing children into the world. There is plenty of scope for cultivating ‘child quality’ thereafter, both in terms of parental time and cash. Thus human capital of the parental generation is ‘transmitted’ to the next generation. The inheritance, may be cultural or genetic (or some combination). Those highly educated women who do have children would have the most to transmit and should, on average, produce the best-educated children. There is however potential conflict between time devoted to employment and time devoted to child rearing. If children with employed mothers receive less time investment, and especially if there are negative influences, such as effects on children of maternal stress or inadequate day care, there would be a trade-off between mother’s employment and child quality.

Intergenerational continuities in education would normally be expected to reinforce tendencies to social polarisation, though other forces may tend in the opposite direction. If mothers’ employment holds back child development, could this be one such force? Is there a reverse cycle leading from ‘riches’ to ‘rags’ in two generations? In other words, is the high employment of highly qualified women leading to under-investment in their children, setting up a countervailing undertow in the inter-generational transmission of advantage?
The evidence assembled here comes from research over the past twenty years on British women and children, by the author and a number of co-authors, using longitudinal evidence, from sources described below. The review addresses three questions:

(1) How do children affect women’s paid work, and lifetime earnings?
(2) How does women’s employment affect the ‘quantity’, and timing, of children born?
(3) How does women’s employment affect the ‘quality’ of children?

In the context of contemporary Britain, these relationships depend upon the woman’s own human capital, or ‘Education’ in the form of qualifications. The educational system may not be entirely responsible for the greater economic success of the more highly qualified, but qualifications mark stratification by earning power which has important demographic and social implications. For children, human capital, or ‘quality’ is assessed here by mainly by the results of cognitive tests. Though the cognitive tests are often labelled tests of ‘ability’, it is not clear how far they reflect learning at school or an endowment of their home background, inherited or acquired. Whatever their source, such test scores have been predictive of later success in exams and on the labour market. I also make use of ratings of the children’s reported behaviour (see Appendix Table A1).

The research surveyed involves relationships between generations and between genders and the balance of productive and reproductive activities. The aim to balance, rather than juggle, them, is a central feature of the lives of women, children, men, and society at large, but is achieved differently in different social strata. The focus is on mothers, because that is where the evidence starts, and the tension is most evident, but not where the questions end (see Joshi 1998, Folbre 1994). This overview is offered as a contribution to the scientific and policy debate in Britain and beyond. It is intended to encourage international comparisons in the application of demographic research to policy analysis, although a complete survey of the
national, let alone international, literature is left beyond the scope of this paper. I also make no attempt to discuss ethnic or regional differences within Britain.

**Plan of the Paper**

After an introduction to the longitudinal data and some descriptive background drawn from the birth Cohort Studies, the three central sections address the questions posed above. The first looks at influences of children on women’s earning power and employment participation. These are summarized in a simulation model of the influence of motherhood and education on a woman’s lifetime earnings. Section 2 looks at education and employment as influences on the number of children born. Section 3 turns to children, and the associations between several of their cognitive and behavioural outcomes and mothers’ employment, educational qualifications and family income. The diversity of results notably by level of educational attainment, have implications for the understanding of social inequality and the formulation of policy about combining paid work and parenthood which are discussed in the concluding section.

**Sources of longitudinal data**

The unfolding of employment and family building careers is better addressed by longitudinal data than cross-sectional surveys. Britain is fairly unique in the range of longitudinal data sets now available. An extensive inventory of these resources in the UK has been published by the ONS (2001) and also an ONS/ISER website. Notable among these are Britain’s long standing nationally representative Birth Cohort Studies. The research reviewed here has used, among other sources, the first three of them which have followed, into adulthood, people born in a week of 1946, 1958, and 1970, see Figure 1. The MRC National Survey of Health and Development (NSHD), follows people born in a week in March 1946, is housed at University
College London. From a follow-up sub-sample of 5, 632, around 4 thousand have been followed into mid-life, the latest of 22 contacts being at age 53 in 1999 (see Wadsworth, 1991). The studies of cohorts born in 1958 and 1970 are now housed in the Institute of Education. The 1958 cohort is known as the National Child Development Study (NCDS) and the British Cohort Study of 1970, as BCS70 (see Ferri (1993) and Bynner et al (1997)).

Each started with around 17,000 births and collected data on around 12,000 cases at their latest sweeps, at ages 42 and 30 in 2000 (see Bynner, Ferri and Wadsworth forthcoming). They had fewer contacts in childhood than NSHD (4 each with the full cohort versus 7). Between age 16 and the 2000 surveys NCDS contacted the full cohort twice in interviews at ages 23 and 33, and BCS70 had one postal survey of the full cohort at 26 (with 9000 responses). The most recent data were not available for the research reviewed in this paper, which made use of the NSHD only up to age 32 in 1978 and NCDS only up to age 33 in 1991, looking at women’s wages in their early thirties and the effects of children on women’s employment. The special second generation study of the children of one third of the people born in 1958 provides data on school age children in 1991 (CHRR, 1998). BCS70 is used here principally for outcomes in early adulthood, 1996, in relation to childhood experiences in the 1970s.

The British Household Panel Study is a complementary source of longitudinal data, a panel of households across Britain and across all ages, modelled on the US Panel Study of Income Dynamics (Taylor 1966). It started in 1991 with surveys following annually ever since. Another strand of the research cited here used data, including retrospective employment histories, from its first four waves, up to 1994, as a major source of evidence on wages,
employment and income. Unlike the cohort studies it covers all ages, but neither source covers whole lifetimes. Where lifetime data does not exist, it has been possible to invent it (Joshi and Davies 2002). Synthesized scenarios, based upon models fitted to the BHPS data, are presented in section 1 below. Two other major longitudinal sources have also been consulted: the ONS Longitudinal Study, which links over 800,000 records from the census and vital registration and the 1980 Women and Employment Survey, with a pioneering set of retrospective life event histories for women (Hattersley and Creeser, 1995, and Martin and Roberts 1984).

Although few countries have a comparable portfolio of longitudinal data resources, there is scope for making international comparisons with at least parts of the following analyses. Some of the replications that have already been done are mentioned in sections 1 to 3 below, involving for example the French record linkage study Echantillon Demographique Permanente and the US National Longitudinal Survey of Youth.

**Key indicators of change**

Table 1 presents a few key indicators of relevant change in the economic and demographic life of the British as seen through the lives of the members of the three cohort studies. Between those born in 1946 and 1970 the level of educational attainment changed dramatically, especially for women. The table shows a rise in the proportion of women with tertiary qualifications from 11 to 32 percent. The proportions with degrees included in this rose from 3% to 17% (through 11% for women in the 1958 cohort). Female educational attainment was rapidly catching up with men’s (and at some levels overtaking them). In the labour market, female disadvantage was also rapidly diminishing. At age 26, the women in
employment from the 1946 cohort, in 1972, were paid on average 63 percent of the hourly wage received by their male contemporaries. In 1981, when the 1958 cohort were 23, the wage ratio had risen to 84 percent and by 1996, the women in the 1970 cohort were receiving over 90 per cent of the men’s wage. This increase may be partly attributable to the relative rise in education, and the accumulation of labour force experience, but the earlier and bigger increase also reflects the introduction of the Equal Pay Act in 1975 (Makepeace et al, 1999, Joshi forthcoming). Although the introduction of equal opportunity policies had their limitations, they did help to improve the prospects for women on the labour market.

Meanwhile, women in their twenties were experiencing an even more dramatic change in the proportions becoming mothers. By age 26, which is a point of contact for both the 1946 and the 1970 cohorts, nearly three quarters (72 percent) of the women born in 1946 had borne at least one child. For the 1958 cohort, 26 was the age (identified in retrospective birth histories) at which half the cohort had entered motherhood. By 1996 only 30 per cent of the 1970 cohort reported having done so. By the time the cohorts were next contacted, at age 30 for BCS70, age 33 for the 1958 cohort and age 32 for the 1946 cohort, the proportions with children had risen, to 54%, 76% and 87% respectively, but the difference between them was still marked. The cohort studies also show how entry to childbearing was, and remains, highly differentiated with respect to educational qualifications. In all cohorts, the least qualified tend to start childbearing before the more qualified, as shown in the Table 1, but the postponement within each level of qualifications means that the overall trend is not just a product of more women being qualified. At 26, there is gap of around half each cohort in the proportion that has become mothers between those with no qualifications and those with tertiary qualifications (degree plus other level 4 diplomas). The qualified catch up in their thirties, but only partially.
The postponement of childbearing helps to explain the rising rates of labour force participation, particularly in full-time employment, shown in Table 1, but there is also a rising level of labour force attachment among those with children of a given age. This is illustrated by a dynamic measure of labour force attachment, the time it takes before a mother resumes paid work after the birth of her first child. For the 1946 cohort this was five and a half years, itself a change from the 8 years we observed for their mothers’ generation, but for the 1958 cohort it was down to 2.2 years. The equivalent data are not yet available for the 1970 cohort, but other evidence on the majority take up of maternity leave provisions suggest it is likely to be under one year.

1 Children’s impact on Women’s Paid Work

1.1 The wages of motherhood

How much a British person is paid per hour can be quite well predicted by their education and employment experience (human capital) and whether they are a man or a woman, at least in data collected around the beginning of the 1990s. Especially for a woman, whether or not she is in a full-time job also matters, part-time jobs being on the whole less well paid for given human capital, than full-time. In our analysis of two birth cohorts in their early thirties, it is possible also to include in human capital, a measure of ability from childhood (Joshi and Paci, 1998, Makepeace et al 1999). Comparing the two ends of the qualifications spectrum, the value of having a degree rather than no qualifications, is estimated as an 80% gain, for 33 year olds in full-time jobs, for someone of given ability and experience. A year of recent experience raised the full-time wage of these 33 year olds by about 7% for women and about 10% for men (Joshi and Paci 1998, Table 4.3).
We asked whether the presence of children reduced women’s pay beyond the downward influence of their lesser work experience, their greater chance of being in part-time jobs than childless cohort members, and the mothers’ lower educational attainments. On the whole, these three factors together were sufficient to explain the 39% gap between mothers and childless women’s pay, among 33 year olds born in 1958 and also among 32 year olds born in 1946. For the mothers, the fact that they had part-time jobs and less human capital and was sufficient to account for their low pay. Among full-timers born in 1958 we did find one group of mothers who encountered labour market penalties over and above those predicted by the human capital model: mothers in full-time jobs who had taken more than a one-year break from employment at the time of their first birth. Their wages were marked down 17%. The mothers who took little or no more interruption than maternity leave were paid as well as the childless women (Joshi and Paci 1998, chapter 6, Joshi et al, 1999). We speculate that this penalty to combining motherhood with staying at home could arise because of lower training, poorer promotion prospects or poorer job match on return to the labour market, rather than the suggestion of Becker (1985) that motherhood makes a woman too tired to put as much effort into her productive work as her childless colleagues.6

The apparent immunity of women in professional careers, in the British cohort, to the pay penalties of motherhood needs to be viewed with caution. They did face penalties of gender. We have little evidence, until the next sweep of NCDS at 42 is analysed, as to whether mothers in professional careers will be as successful as other women, or men, in rising up the career ladder. Does a glass ceiling form more of block for women with children than women in general? This remains on the research agenda.
We turn to an analysis of the wages of women of all ages, from the BHPS in 1994 (Davies et al 1998), done as part of a programme of work on income over the lifecycle. This confirms the broad picture: the payoff to a degree (over no qualifications) is about 100%, controlling for experience but not ability. The payoff to experience was steeper for the more qualified, though it levelled off over mid life. Towards the beginning of a career, the percentage loss of full-time earnings, per year taken out, would be about 10% for the highly qualified, and 8% for the less highly qualified. As in the cohort studies, men and women were paid unequally for a given set of human capital. This is relevant to the issues around women and children, as the higher price on a man’s market time will tend to reinforce the tradition of mothers rather than fathers adapting their market work. Also the low pay of women in general may arise from the expectation of a domestic role, being held against women even when they have no current commitments.

The extent to which mothers’ wages fall short of other women’s, sometime called the ‘Family Gap’, varies a good deal across countries. Harkness and Waldfogel (forthcoming) present evidence and analysis for seven industrialised countries. Before and after the controls in their regression analysis, the UK stands out as having the by far the greatest family gap. In sample of women of all ages (rather than the 33 year olds considered above), the adjusted mark-down for a woman with two children was 32% in UK, nothing significant in Sweden or Finland, and intermediate (around 10%) in Australia, US, Canada and Germany. A good part of the exceptional position of Britain could be attributed to the low pay of part-timers, but the authors suggest that the international differences may be best understood in the context of the different family policies across nations.
1.2  Effects of Motherhood on Participation in Production

In the early post war years the employment of mothers was frequent only among working class families in certain regions of Great Britain. In the next few decades regional and socio-economic differentials narrowed (Joshi 1985, Joshi and Hinde 1993). In evidence about women’s paid work collected for the years leading up to the Women and Employment Survey in 1980, the dominant predictor of whether a woman would have full-time employment, was the absence of responsibility for children (Martin and Roberts 1984). Mothers of pre-school children were mostly at home, and mothers with children at school were typically employed part-time, often doing jobs at a lower skill level than they had attained before their employment break (Dex, 1987, Joshi and Newell 1997). Most mothers combined employment and childrearing on terms that compromised, but did not completely sacrifice, lifetime earnings (Joshi 1990a, Dex and Joshi, 1999). Schools were a major source of daycare, free but not unlimited.

The dominant pattern of interrupting employment while children were below school age was also found in Germany and the Netherlands, but was not characteristic of all other industrial countries (Kempeneers and Lelievre, 1991, Drew et al, 1998). Whether as cause or effect, countries with more continuous employment by mothers (eg France and Scandinavia) have a larger infrastructure of institutions providing childcare (Joshi and Davies 1992, Gornick, et al 1997, Meyers et al 1999), as also remarked by Harkness and Waldfogel (forthcoming), cited above.

By the 1990s the British picture had changed substantially. The majority of mothers of pre-school children were in paid work. Over a two-thirds returned to employment for at least a
spell in the year after the birth of their first child (Callender et al 1997). A growing minority sustained a continuous full-time career, punctuated only by maternity leave, and facilitated by the purchase of child-care. As shown in Table 1, we compared the length of employment breaks taken by mothers up to 1978 and 1991 in the 1946 and 1958 cohort studies, respectively (Macran et al 1996). There were sharp contrasts at higher levels of educational attainment. Among those born in 1958, well over half the graduates who had become mothers by age 33 has resumed employment within a year of their first birth, whereas for graduate mothers in the 1970s, it was more than 5 years before half had returned to a job. At the other end of the scale, for women with no qualifications there was little difference between the cohorts, in both cases the median gaps were also around 5 and a half years. We saw a widening gap emerging among Britain’s mothers (Dex et al 1996), although women’s earnings had hitherto had an equalising impact on the income distribution (Davies and Joshi 1998). Women in professional careers are paying women with few qualifications to take care of their young children. Other mothers are still largely relying on the teaching profession.

The same pattern of social divergence appeared in BHPS in the 1990s, in the study we did for the Women’s Unit of the Cabinet Office (Rake ed. 2000). This used a simulation model developed over a number of years from my first attempt to quantify the cash opportunity cost of childbearing in Britain (Joshi 1990). The model relies on generating employment and earnings histories for ‘typical’ individuals. It is based on stylised biographical assumptions and the parameters of models fitted to cross-sectional earnings and participation data, along with a summary of labour market experience. Past work experience helps predict wages which help predict employment and feed into estimated income. The simulation assigns a woman to employment in any year when her predicted probability of employment exceed 50 per cent, and to full-time or part-time work according to whichever is more likely.
Calhoun and Espenshade’s (1988) estimates of lifetime earnings foregone by US mothers, it does not attempt to simulate a whole population. Details of the method are set out in the appendix of the Cabinet Office report Rake (ed. 2000) and in Davies et al (2000). This method has also been applied to France, Germany and Sweden, (Joshi and Davies, 1992), (Davies and Joshi, 1994), and by Dankmeyer (1996) to the Netherlands. In comparison with our 1980-based model for Britain, Germany and the Netherlands looked fairly similar, but mothers’ foregone earnings were much smaller in France and Sweden, as they also appeared in the US on the different methodology of Calhoun and Espenshade. Our simulations of earnings lost to motherhood, based on 1994 data, are very similar to the 1980-based ‘Tale of Mrs Typical’ (Joshi et al 1996), but only for some groups of women. These are the low skilled, and indeed the mid-skilled if they embark on childbearing early, i.e. up to their mid-twenties.

Figures 2-4 around here

Figure 2 shows the gross earnings profiles constructed for the hypothetical low skilled woman using parameters from the 1990s. She is assumed to have her first child at age 23 and to take a nine-year break from employment, if she has two children. She returns to the labour market initially part-time, and when she eventually resumes full-time employment, her pay does not reach the level it would have done had she remained childless and in uninterrupted employment. The earnings trajectory of such a childless counterpart is plotted in the solid black line. The area between this solid line and the others represents foregone earnings for each number of children. For two children this amounts to 58% of earnings after the year of the first birth.
For mid-skilled women who have accumulated earning power through deferring motherhood to the current average age of 28, the simulated earnings losses are much smaller (see Figure 3). The simulated scenario is that she not leave paid work, apart from paid maternity leave, until the second child, and then takes only two years out if she has no further births\textsuperscript{10}. The earnings loss for a family of two comes out around one quarter of post childbearing earnings, rather than over a half.

Women with degrees had become more numerous by the 1990s and they were also likely to defer motherhood until at least age 30, as assumed here. For them the simulated earning loss from motherhood is minimal (see Figure 4). There is no loss of earnings at all associated with the first birth at age 30 (assuming maternity leave during full-time employment is fully paid), for a second birth there is one year of part-time employment assumed, and two years at each of the third and fourth children for the hypothetical mother of four. In the case of the latter it can be seen how earnings drop after each interruption, and that when she returns to full-time employment her wages are, for some years, marginally below those of graduate women with no or fewer children. Nevertheless the earnings conceded to motherhood by either of the graduate mothers are on a much smaller scale than by the less educated women. These ‘earnings regained’ are likely to be partly offset by increased expenditure on childcare. Women with high earning power are more likely to be afford unsubsidised private services, and more likely unable to afford not to make them.

Figures 5 and 6 around here

Figure 5 summarises the sources of earnings loss for a mother of two children. For the unskilled the losses are roughly evenly divided between lost years, lost hours and lost pay
(embracing the part-time penalty as well as the consequences of losing experience). At the other end of the scale there is no loss of years, and what loss there is comes mainly from doing two years part-time rather than full-time. In the mid-skill case the nature of her employment profile and earnings losses are sensitive to the age at which she is set to bear the first child (Figure 6). If she starts motherhood early, the model predicts that she drops out of paid work for seven years. Her earnings loss has the same composition, but is worth more, than in the unqualified case. Beyond age 27 she would stay in the labour force between the two births, and only have a short break after the second.

The implications of forgone earnings for lifetime income are complicated by the interplay of taxes, benefits, pension contributions, pensions and the sharing of net income within the family. These are also explored in the model of lifetime incomes (Rake (ed) 2000). The main point to note here is that the more is old age income support a function of pre-retirement earnings, and the more has a mother forgone earnings, the more will the cash penalties of motherhood be projected beyond age 65. The scenarios presented here imply differing degrees of financial independence for the different hypothetical women in old age as well as during family building.

Mothers’ employment in Britain in the 1990s acquired a socially structured diversity. Compromises to combine motherhood with employment, reproductive with productive work, are still being made. They take several forms: flexible hours, part-time working, shift working, term-time working, tele-working etc (Dex and Joshi 1999). Full-time workers, especially, invest in formal child-care, but ‘informal’ participation of fathers, grandparents and neighbours is a vital element of the arrangements mothers make (Ward et al 1996). The constraints facing lone mothers are (or have been) particularly stark, for part-time earnings
may well not be sufficient for a sole breadwinner, and the child-care to support full-time employment may not be available or affordable. Neither, till the end of the 1990s have means tested benefits for single parents encouraged paid work (Joshi 1990b). During the 1980s and 1990s lone mothers were less likely than married mothers to have paid work.

Another group facing limited options in the combining of parenthood and paid work is men. Work organisation and culture seldom makes it easier for a father than a mother to adapt time to accommodate reproductive or domestic work (Joshi 1998). Higher rates of pay for men usually mean that a two-parent family has less cash to lose in cash if the father rather than the mother give priority to earning. Families do need cash as well as parental time.

2. The Impact of Women’s Productive Role on the Quantity of Children

Does participation of women in the economy reduce fertility? The view that women’s entry into the labour force inhibits the number of children born is widespread, but not universally accepted. Some demographers hold that ideational factors and contraceptive technology have driven internationally similar fertility trends in developed countries (Lesthaeghe and Surkyn1988, Murphy 1993, Hobcraft 1996). Although these are not necessarily incompatible with materialist explanations of motivation, there is not much British evidence (yet) of economic incentives or constraints having an overwhelming or lasting effect on completed fertility.

Table 2 around here

Table 2 summarises two indices of cohorts’ completed reproductive record (average number of children born and the proportion having at least one child) alongside an alternative
summary measure of fertility, the synthetic period total fertility rate, and a synthetic measure of cohort labour force attachment. It considers cohorts of women born at twelve year intervals and takes the data from the official registrations in England and Wales, not the Birth Cohort Studies themselves, though these have provided the last three years of birth represented. Going back 12 years from 1946 includes the 1934 birth cohort which happened to be to have peak cohort fertility in the baby boom of the 1960s, and who happened to be at age 30 in 1964 when the period fertility indicator was at its peak. The 1922 cohort is included to show pre-peak experience, though the fertility trough came earlier (to those born in the first decade of the Twentieth Century). It is well established that cohort fertility varies rather little compared to period indicators which are sensitive to birth timing. Over about thirty years the average number of children per woman did not deviate greatly from the 2.1 needed for cohort replacement. Since the peak of the baby boom, completed fertility has fallen by under half a child for the cohorts who have so far approached the end of their reproductive span. The period fertility indicator had fluctuations over the corresponding years ranging more widely from 2.93 to 1.66. As the changes in cohort fertility have themselves been modest, the long-term trend towards female labour force attachment could at most have had only a modest effect, probably among other factors. To investigate the presumed relationship, we used the index, shown in Table 2, of labour force attachment net of current responsibility for children, in a multivariate model of parity specific births of births between 1952 and 1980 (De Cooman et al 1987). It was intended to capture the idea of Butz and Ward (1979) that the proportion of women who expected to be in a two-earner couple would affect fertility reactions to labour market signals. At the bivariate level there is not much prima facie evidence of a fertility-employment trade-off, for the cohorts up to 1958. For the cohorts born before 1934 labour market attachment and fertility were both growing strongly in the same direction. After the start of the ‘baby bust’, female labour force attachment, measured in this way, continued to
rise, but its growth had slowed down. Neither did we detect much impact of the growth in cohort labour force attachment on births in our multivariate analysis, also controlling *inter alia* for women’s and men’s wages and unemployment\textsuperscript{11}. Any long-term relationship in recent years, and in the as yet uncompleted fertility of women born in the 1960s and 1970s remains to be seen.

The main conclusion of our econometric time series analysis (further elaborated by Ermisch 1998) was that influences from the labour market to fertility behaviour are likely to be felt in tempo than quantum, and that the improvements in the female labour market in the 1970s associated with the Equal Pay Act intensified the rescheduling of births, particularly first births at that time. This aspect of the variation in fertility timing in the post-war period is also shown in Table 2, comparing the proportion of women who had become mothers (or who are projected to do so) by the ages of 45 and of age 30, the halfway point in the childrearing span. The former ranges relatively modestly from 82\% for the 1922 cohort to a peak, 91\%, for (this time) the 1946 cohort, back through 82\% for the 1958 born and is projected to drop to 77\% for the 1970 cohort. The range of 14 percentage points represents an increase in childlessness contributing to the modest fall in average births per woman. The proportion of women who had already had their first child by age 30 - ranging by 26 percentage points from 84\% for the 1946 cohort to 58\% for 1970 cohort, shows how once the baby bust was underway it involved a delay in the start of childbearing (also apparent in the cohort study data in Table 1, and also applies in other European countries, Gustafsson, 2001).

Childbearing at all parities in the early 20s has been overtaken in numbers by births to women in their early thirties. Despite this general trend to later childbearing, childbearing under 20 has changed little in quantity since the late 1970s. This contrasts to a continuing downward
trend in teenage fertility Europe, but resembles other English-speaking countries (Coleman and Chandola, 1999). Social differentials in the timing of entry to motherhood are not confined to the Britain as shown in Table 1, but are contrasted they are not identical. Comparing Britain and France, Ékert- Jaffé et al (in submission) find social differentials in birth probabilities are becoming more marked in Britain and less so in France\(^1\)\(^2\). As suggested in Table 1, differential timing of motherhood according to the woman’s education, and the rise in the latter, have helped to account for the average delay in British first births, but do not do so completely.

Early motherhood is increasingly confined to unmarried, unqualified, and arguably otherwise unemployed young women (The Social Exclusion Unit 1999). The better educated a woman is, the more likely she is to defer childbearing, particularly in more recent cohorts. In NCDS, at age 33 in 1991, only 16% of the least qualified women had not yet had children, compared with 46% of the graduates (Dale and Egerton 1997). At least one third of the childless graduates reported that they would like to have children, and some of them have gone on to do so in their later thirties and forties (42% of the female graduate cohort members in the age 37 sub-sample were still childless). The proportion not wanting children ever is small, though larger among graduates, 8.6%, rather than 5.0% for the cohort as a whole. Though the final tally for this cohort is not yet known, it appears that the most educated women are more likely to end up having fewer children, at more advanced ages, than women who have finished education and started childbearing young.

Is the reproductive shortfall of the educated the result of employment or education? Highly educated women usually do become mothers, and often avoid having to sacrifice labour market opportunities, but they usually have to face the challenge and the cost of making
child-care arrangements. The association of education and earning power could even produce a positive effect on the family size. As John Ermisch (1989) pointed out, higher earning power implies higher power to purchase child care. Motherhood and employment are not stark all-or-nothing alternatives. As options emerge to combine them, the grounds to expect women’s employment to have a big effect on fertility have weakened (Bernhardt 1993). Although there is clear evidence for opportunities for women in education and jobs changing the timing of childbearing, in ways which maintain differences across the social spectrum, I would suggest that the impact on the quantity of children is not enormous. Adaptations in employment, as discussed in Section 1, may have limited the adaptations British women have needed to make to their long-term fertility.

3. The Outcome for Children

What about the impact of increased education and employment of women on the ‘quality of children? Might there be relationships here, which redress, or indeed worsen, any effect on the ‘quantity’ of children born in Britain in recent decades? Recall the idea that education should, on average, make people productive in unpaid as well as paid activities, thus raising the ‘input’ received by their children. On the other hand, paid employment may reduce parental ‘investment’ in a child’s upbringing. This section considers effects on British children of their mothers’ human capital as well as of their employment. It turns first to the data and methods used to examine these issues.

3.1 Some remarks about data and method
The estimates of child outcomes are taken from several analyses of the one-third sample of children whose parents were members of the NCDS. The interviews also took place in 1991, when the cohort members were 33, but their offspring ranged in age from 0 to 17. We looked at the children who were old enough to do tests, who all therefore had parents who were relatively young at the time the children were born. In most of the analyses we took just the children whose mothers were cohort members. The regressions, primarily designed to look at the relationships between family structure, and maternal employment and cognitive development also controlled for maternal ability and education, providing estimates of interest in themselves. On family structure, I will just note that the negative ‘impact’ of lone motherhood and step families on cognitive outcomes was substantially accounted for by the poor economic circumstances of these families (Joshi et al 1999).

It is always necessary to be cautious about treating the terms estimated in these regression models as ‘effects’, as causality cannot be strictly proven (see Ni Bhrolchain 2001). In the case of these intergenerational analyses of the cohort studies, such an interpretation is not, however, unreasonable. Many predictors clearly occur before the outcomes, especially if measured in the parent’s own childhood, which rules out reverse causation. The rich set of measured information, collected prospectively also helps to reduce the possibility of unmeasured factors generating spurious correlation.

3.2 The impact of mother’s human capital on child development

Before turning to the estimated effects of mothers’ employment on child development, I consider those of mother’s education and human capital, since the impact of employment cannot be assessed without also controlling for the ‘quality’ of the mother’s earning power. In our study of maternal employment, child development was measured in the NCDS Second
Generation in two cognitive tests, reading and maths, and two summaries of behaviour reported by the mother. Our models, reproduced in the Appendix, control for of mothers’ ability and attainment, as well as the child’s age, sex and birth order, the family living standard, as proxied by housing tenure, and in Table A4 family structure (Joshi and Verropoulou, 2000). The mother’s ability measured in childhood, by her general ability score at 11 and her score on a reading test at 7 is one of the prospectively measured predictors. It probably reflects a combination of genetic factors and early environment at home and at school. These had strongly significant effects on the offspring’s Reading, Maths and Aggressive-type behaviour (though there is no association with Anxious-type behaviour). A 10-point increase in both the mother’s ability scores would appear to raise her child’s reading score by 5%, the maths score by 3% and reduce the Aggression score by 2%16. Thus there is some transmission, but it is not perfectly determined. Plenty of these children also achieve, or fail, despite the parental precedent.

Note also that the estimated impact of a girl’s ability score on her own earning power as an adult is not dissimilar to its estimated ‘return’ in reproducing ‘quality’ in her children – or at least in the replication in children’s test scores. The ‘payoff’ to gaining 10 points on the 11-year-old general ability score was 4% in hourly pay at age 3317, mid way between the ‘payoff in child’s maths and reading scores. To the extent that the ability term reflects a genetic inheritance, this similarity may not be surprising, but it also suggests that productivity, whatever its source, is not confined to the labour market.

As the Appendix shows, that mother’s formal qualifications are also positively associated with children’s cognitive scores, (the maths and reading tests), and with the rating for Aggressive type behaviour, but again not Anxiety18. They are also associated with the
Peabody Picture Vocabulary Test (McCulloch and Joshi, 2001, forthcoming). The magnitude of these estimates depends on what else is being held constant, and is reduced by the inclusion in the regression of the mother’s test scores in childhood (Joshi and Verropolou 2000). However the payoff to qualifications (unlike ability) is clearly better on the labour market than in childrearing. The payoff on the wage rate to (a broader sample of) mothers from having a degree versus no qualifications was 74% in full-time and over 100% in part-time jobs (Joshi and Paci 1998 Table 6.3). The differentials attributable to the same contrast in mother’s qualifications on the reading, maths and aggression scores of their children would be about 10% (see Appendix). Native wit (or perhaps success in primary school) seems relatively more effective in the nursery than formal qualifications. We also found that the effect of mother’s education on child development works more through the provision of a cognitively stimulating home environment than does the pathway from mother’s ability (McCulloch and Joshi 2001). Material as well as human resources appeared important, at least in the longer term, for child development in all our studies (Joshi et al 1999, McCulloch and Joshi forthcoming). Parental aspirations for their child and interest in his or her education also play a role. Their association with successful outcomes in young adults has been shown by (Wadsworth 1991, Schoon and Parsons in press).

3.3 Mother’s employment

The study on maternal employment looked for an impact on children of their mothers taking paid work, after allowing for the family’s current living standards to which the mother’s earnings may have contributed (Joshi and Verropoulou 2000). Mothers’ employment was measured at various stages of the child’s first five years, and at the time of the interview when the children were aged between 5 and 17, and mothers’ education was also included, as we have just considered. It was not until we introduced the mother’s ability as measured in her
own childhood test scores that any significant negative relationship emerged\textsuperscript{19}. Even then, the main picture of our results, for these relatively young mothers, was that the impact of maternal employment was mixed and minor.

Figure 7 around here

Figure 7 summarises the estimated ‘effects’ and the margins of error around them. The sets of estimates from which they are drawn are reported in the Appendix. Few have confidence limits which exclude zero. One such significant estimate is for reading by the child at school age and the mother’s employment in the first year of a child’s life - a lower score by around 2 percentage points. But the negative impacts on other outcomes were not significant. Most of the associations we estimated were neither significantly positive nor negative, but there were also a couple of significant positive estimates. Children were slightly less anxious if the mother had a part-time job after the child’s first year, especially currently part-time. We did not have information about the father’s employment history, but, if he was unemployed at the time of the survey, the test scores tended to be lower. This again points to the importance of family income in helping children to develop. Another important conclusion we drew from our attempts to make our subjects conform to a model of predictable behaviour, was that many of them did not conform. The children’s own efforts, as well as chance, doubtless play a part in producing the variability observed.

We pursued the notion that there might be effects of early maternal employment which only come to light in adolescence or later, and which would not have been apparent in our analysis of the NCDS second generation. We turned to the 1970 cohort, where parents at all ages are represented, and looked at the members of this cohort as young adults in 1996 (Joshi and
Verropoulou, 2000). We analysed outcomes by whether their mothers had been in employment, when our subjects were under 5 (in the early 1970s) and for the family’s educational and economic background. Cohort members’ test scores at age 10 were not related to the mother’s early employment, though they were to social class, parents’ schooling, and indicators of poverty – as in the Second-Generation study. The early adulthood outcomes of teenage motherhood, or, for men, substantial unemployment, were also unrelated to the mother’s employment. However, for qualifications, both men and women showed a statistically significant deficit, lowering the score, which ranged from 0 to 5 as detailed in note 1, by about one tenth of a point, if their mothers had been employed in their pre-school years. Perhaps these were ‘sleeper’ effects, which emerged when the subjects faced the undoubted challenge of public examinations.

At the end of this part of the story there is not much evidence that the ‘working mother’ is jeopardising child development very greatly, especially if the benefit of her earnings is brought into the account. A similar remark has formed the subject of the Presidential Address to the Population Association of America in 2000, by Professor Suzanne M. Bianchi (2000). She points to the paradox of increasing time being spent by American mothers on the labour market, without any, or much, deleterious impact on American children. She looks for explanations beyond the injection of cash brought home by the employed mother, and suggests that that one answer may be that the amount of time devoted to children has not changed much. It may have been small in the past, when families were large and housework was arduous. She also points to increases in the time fathers spend with children, and children spend out of the home. Evidence for Britain points in the same direction (Jenkins and O Leary, 1995). Fathers’ participation in domestic work and childcare seems to be greatest also in the dual-earner, dual degree families (Dale and Egerton 1997, Joshi and Davies 2000.)
Mothers with full-time jobs sacrifice leisure, and sleep, so that their paid time is not all diverted from their children. Quality and quantity apply also to parental time. We cannot necessarily assume a one-on-one trade-off between the quantity of time in paid work and the ‘quality’ time devoted to children. Given appropriate support, people with multiple roles may make better use of their time through multi-tasking.

Conclusion

To summarize: motherhood and employment are combined with varying degrees of compromise, in Britain at the turn of the Millennium. At one extreme is the career woman who balances baby and briefcase. Many do not attempt her feat, some who do abandon it, others stay at home when their children are small, or only take part-time jobs. A few reject all the options for raising children and remain childless. Well-educated women experience least loss of earnings on motherhood, but are most likely to postpone or avoid it. Economic opportunities for women do not appear, so far, to be seriously jeopardizing the quantum of reproduction. The ‘quality’ of children has a large random element, but is positively affected, among other things, by the mother’s ability and education and parental affluence. Children’s ‘performance’ is not much affected by mothers taking paid work, except for smallish shortfalls in test scores associated with employment when children are infants, and in their eventual formal qualifications. There are also signs of some development gains in children of employed mothers. Perhaps these mixed, minor and variable results reflect the adjustments that many mothers make to protect their children.

This is not the material for a self-correcting riches to rags cycle. The offspring of the most advantaged reap the benefits of the human and material endowment, without, in general,
much handicap from having two-career parents. The story is more one of riches to riches, and rags to rags - the widening gulf among mothers polarising the life-chances of children as well.

If there are negative long-term sequellae for children to early maternal employment, this does not mean that the only way to prevent them is to ban mothers from the labour market. There are other issues: the value to the child of the resources the earning parents bring into the home, the quality of day care; the terms on which employment is organized and its hours; and the way in which an employed mother spends the time which she has with her child. It is not known how much ‘quality time’ with children is affected by paid work. Other pieces of unknown territory in the sort of multi-purpose, but home-based, data sets used here are the daycare settings for children who go to them, and the quality of schools (and classes) for the children who attend them, the culture and flexibility of the workplaces(s), and the neighbourhood amenities.

These would help answer the central question about the way in which parenting and production are being combined, and indicate ways in which the options may be improved. What are the terms on which parents may balance, rather than juggle, multiple tasks?

Balancing job, children and home is difficult for any family, but especially low earners. The options facing families - about hours of work, affordable childcare, or providing your own - need to be improved and diversified. Government and employers need to make it possible for all families to make their own choices and improve the quality of life of parents and children.

I have made limited reference to the world beyond Britain, but one should not expect these results to apply uniformly across developed countries, given the variety of institutional and ‘gender arrangements’ that may promote or hinder the combination of women’s productive
and reproductive roles (Pfau-Effinger 1998). Formal and informal institutions differ across countries in respect of in the provision and pricing of childcare, in the wages accessible to women, in the terms on which they are families are taxed, and above all, in the norms about acceptable and feasible practice. The grounds to expect women’s employment to have a big effect on the number of children born have weakened. Eva Bernhardt (1993) (and Britta Hoem 1993) pointed out how women in Scandinavia were among the first to be able to pursue a ‘combination strategy’. Alena Heitlinger (1993) suggests that institutional arrangements such as Sweden’s would be more supportive of reproduction than more traditional models of gender roles. This theme which is elaborated by Peter McDonald (2000) looking at the balance between gender equity in the family, the market and the state, in the wider context of the fertility transition. Although this review does not cover such a wide canvas, I hope it may inspire similar analyses and syntheses in other countries, or at least to help make the case for appropriate data collection.

To round off, I return to the question of how Education is inter-twined with Reproduction and Production in the British context. The New Labour government of 1997 has extolled Education as a priority, if not a panacea. Can it solve the problems of Production, Reproduction and Redistribution? Education may reduce reproduction somewhat, but it compensates by increasing production (and home production) through raising the skill or human capital of, at least some, the humans who receive it. But does it solve the issues of equity, between genders - men and women; between generations - children, parents and grandparents; or within generations - between the most and the least disadvantaged?

To take the last issue first, we have seen that education is associated with differential outcomes, and is most helpful to those whose own endowment of social and parental capital is
already auspicious. The home and the school have tended to act as complements rather than
substitutes, as witnessed in our comparison of young adults in the 1958 and 1970 cohorts
(Bynner et al 2000). The analysis presented here does not suggest that maternal employment
breaks a ‘riches to riches’ cycle, but may be opening up economic disparities between
families. Compensatory or remedial interventions, such as Sure Start (modelled on the US
Head Start), are underway. On the question of equity within the generation there is the issue
of whether sustaining the continuous careers of the highly qualified requires an army of cheap
child care labour from less qualified women. Such a market solution is a far cry from high
quality mass childcare with staff trained in child development, as can be found in Sweden,
where the welfare state is committed to both child welfare and the equality among adults.

On the question of equity between generations, there must be limits in the extent to which
educational interventions can simultaneously benefit the elderly as well as families with
children in their early years. Though some senior citizens may welcome access to lifelong
learning, many would also welcome better compensation in their pensions for a lifetime
subordinating paid employment to reproduction and caring (Arber and Ginn (1991), Joshi

Finally, on gender equity, the evidence suggests that increases in education reduce the
difference in earning power between men and women, and the difference in hours of paid and
domestic work of couples, but it has not done so completely. Remaining differences range
from the under-representation of women in top jobs to the long paid hours and low domestic
participation of most fathers. The impact of education is almost inevitably uneven across the
social spectrum. It could be a long or futile wait for gender equity to be introduced by
educational stealth. Positive priority is needed to improve the attainments of women in the
productive sphere, but is also much needed to improve the balancing of paid and unpaid work for both men and women. Diverse circumstances require diverse solutions. I subscribe to the growing belief these will be improved if the renewal and development of the next generation in the family can be pursued without requiring the subordination of women. Reproduction is worthy of public appreciation and support, and as a venture in which government, employers, schools fathers and mothers need to work together.
References


Kempeneers, Marianne and Eva Lelievre. 1991. \textit{Employment and Family within the Twelve}. (Eurobarometer 34), Brussels: Commission of the European Communities.


### Table 1

**Key Indicators of Economic and Demographic Change: Evidence from the British Birth Cohort Studies**

<table>
<thead>
<tr>
<th>Year of birth</th>
<th>1946</th>
<th>1958</th>
<th>1970</th>
<th>Source*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Percentage with No Qualifications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>42</td>
<td>14</td>
<td>5</td>
<td>For BCS70 Joshi and Paci 1997, Age 26 survey</td>
</tr>
<tr>
<td>Men</td>
<td>43</td>
<td>12</td>
<td>7</td>
<td>“” “”</td>
</tr>
<tr>
<td><strong>Percentage with Tertiary Qualifications (level 4 and above)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>11</td>
<td>25</td>
<td>32</td>
<td>Joshi and Paci 1988, Table 3.5, Joshi and Paci 1997</td>
</tr>
<tr>
<td>Men</td>
<td>22</td>
<td>28</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td><strong>Ratio of women’s to men's wage at 26 (23 for 1958 cohort)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.63</td>
<td>0.84</td>
<td>0.91</td>
<td>Joshi and Paci 1988, Table 3.5, Joshi and Paci 1997</td>
</tr>
<tr>
<td><strong>Percentage of women who were mothers by age 26</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All women</td>
<td>72</td>
<td>50</td>
<td>30</td>
<td>Macran et al 1996, Joshi and Paci 1997</td>
</tr>
<tr>
<td>At selected levels of qualification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No qualifications</td>
<td>81</td>
<td>69</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Level 2 qualifications</td>
<td>65</td>
<td>47</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Tertiary qualifications</td>
<td>31</td>
<td>18</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td><strong>Percentage of women employed in early thirties</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>25</td>
<td>37</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>Part-time</td>
<td>29</td>
<td>32</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td><strong>Median gap in employment after childbearing (years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.5</td>
<td>2.2</td>
<td>n.a.</td>
<td>Macran et al, 1996</td>
</tr>
<tr>
<td><strong>Sample No's at age:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>2751</td>
<td>5583</td>
<td>5447</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>2875</td>
<td>5786</td>
<td>5772</td>
<td></td>
</tr>
</tbody>
</table>

* Unless otherwise specified the estimates are taken from the preliminary report on all three studies (Bynner et al forthcoming), and the editors’ permission is gratefully acknowledged.
### Aggregate indicators of fertility and labour force attachment since the Baby Boom: Selected Birth Cohorts of Women in England and Wales 1922 to 1970.

<table>
<thead>
<tr>
<th>Completed Cohort</th>
<th>Total Period Fertility rate in year aged 30</th>
<th>Percentage having at least one child by 45</th>
<th>Percentage having at least one child by 30</th>
<th>Long-term indicator of Employment Attachment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>1922</td>
<td>2.05</td>
<td>2.16</td>
<td>82</td>
<td>73</td>
</tr>
<tr>
<td>1934</td>
<td>2.42</td>
<td>2.93</td>
<td>89</td>
<td>82</td>
</tr>
<tr>
<td>1946</td>
<td>2.19</td>
<td>1.91</td>
<td>91</td>
<td>84</td>
</tr>
<tr>
<td>1958</td>
<td>1.98 (a)</td>
<td>1.82</td>
<td>82 (a)</td>
<td>68</td>
</tr>
<tr>
<td>1970</td>
<td>1.81(b)</td>
<td>1.66</td>
<td>77 (c)</td>
<td>58</td>
</tr>
</tbody>
</table>

**Source:**
Cols 1-4 Birth Registration Statistics for England and Wales.
Col 5. De Cooman et al 1987: A Synthetic indicator of long-term labour force attachment derived principally from analysis of employee rates during the period 1950-74 (Joshi and Overton) extrapolated to the 1960 Cohort with reference to qualifications reported in the 1971 Census.

**Notes:**
(a) Based on data to age 42
(b) Government Actuary (2000)
(c) 1996-based projection quoted in Government Actuary (2000)
(d) Illustrative extrapolation well out of range of evidence used in model.
British Longitudinal Birth Cohort Studies
(NSHD, NCDS and BCS70 based on one week’s births)
(MCS selected from one year’s births)

Child of the New Century

survey
minor survey...
Figure 2

Woman's Earnings over the Lifetime:
LOW QUALIFICATIONS

![Graph showing woman's earnings over the lifetime with different scenarios for number of kids.](image-url)
Figure 3

Woman's Earnings over the Lifetime:
MID QUALIFICATIONS

£'000s p.a.

- No kids
- 1 kid
- 2 kids
- 4 kids

Womans age
Figure 4

Woman's Earnings over the Life-cycle: HIGH QUALIFICATIONS

£'000s p.a.

<table>
<thead>
<tr>
<th>Woman Age</th>
<th>No kids</th>
<th>2 kids</th>
<th>4 kids</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>35</td>
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<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Woman Age
Figure 5

The earnings cost of two children: total and composition

[Bar chart showing lifetime cost (£'000s) for different qualifications of mother (Low, Mid, High). The chart breaks down the cost into Part-time penalty, Lost experience, Lost hours, and Lost years.]
Figure 6

Earnings cost for 2 children by AGE OF MOTHER: Mid Qualifications

- Part-time penalty
- Lost experience
- Lost hours
- Lost years

Age of mother at first birth

Lifetime cost (£'000s)

- 300
- 250
- 200
- 150
- 100
- 50
- 0

24 26 28 30
Impacts of mother’s employment on child scores
with 95% Confidence interval

SOURCE: NCDS SECOND GENERATION

Age of child at time and hours of mother’s job
This is measured, for adults in terms of the highest qualification reported to surveys, broadly classified, grouped into:

5) qualifications at the university level (‘degree’);
4) other tertiary qualifications usually obtained after leaving school at age 18;
3) ‘A-level’- roughly equivalent to US High School or Baccalaureat;
2) a lower level of examinations obtained around age 16 (includes ‘O levels’);
1) a minimal level of ‘some qualifications’ below ‘O level’;
0) and no qualifications.

As is the fourth national birth cohort study, the Millennium Cohort Study with subjects born over 12 months in 2000-2001

The decline in the proportions with no qualifications may be overstated by the still provisional estimates for the 1970 cohort, but there is no doubt about the direction of change.

Comparison with birth registration data indicates this is an underestimate for the whole population, possibly connected with low response to the postal survey. The official figure for England and Wales is 43%

Our models investigated possible biases from selection into full and part-time employment and into motherhood, but we did not attempt to model choices about education.

Rejecting such an assertion accords with the result of another analysis, where the outcome was mortality, based on the ONS Longitudinal Study. We found little evidence that mothers carrying the ‘double burden’ of job and children were facing a higher risk of premature death (Weatherall et al 1994).

Funded by the Leverhulme Trust

Evaluated after 5 years. The return falls to under 2% after 20 years.

The controls were age, education, education, ethnicity, region, urban residence and marriage, but not work experience. The coefficients have been transformed to express percentages as a percent of mothers’ pay, as above. Another feature of using data, which covers all ages of women, is that increasing differentials with the number of children are apparent in this LIS-based study.
10 The probabilities of participation or non-participation are fairly close while children are young, so in practice many variants of this trajectory will be observed, including ‘back to the kitchen sink’ transitions out of full-time employment.

11 Apart from an acceleration of third birth probabilities towards the late twenties and away from the late thirties as labour force attachment rises. An argument for why such positive relationship might be expected has been offered by Ni Bhrolchain (1986).

12 This study is a rare example of a comparison of the census-linked datasets which exist in the two countries: the ONS Longitudinal Study, and the Echantillon Demographique Permanente.

13 Work sponsored under the ESRC Children 5-16 Programme and by the Smith Institute is association with Harriet Harman M.P.

14 Note that our evidence does not necessarily apply to any child whose cohort member parent was over 28 at the time the child was born. We will not be able to test if our results can be generalised to children of older parents within the 1958 cohort, as further follow-ups of the second generation have not been funded. Nevertheless, this is an extraordinary opportunity to link observations on children with information about the parents collected a generation earlier. We are able to use childhood test data and other variables to observe differences between parents, and we do control for mother’s age, although it is still true that generalization to other children requires caution.

15 Children with fathers by 33 in the cohort were rather less numerous, and there was no counterpart in the US NLSY surveys of mothers and children with which we made comparison.

16 Derived from Table A3, effects evaluated at the mean of dependent variables.

17 For cohort members who had become mothers by age 33 in both full and part-time jobs, also controlling for education and work experience, Joshi and Paci 1998, Table 6.3.

18 Note that many of the most highly qualified mothers did not yet have children, if any, old enough to do the tests.
This resembles the sequence of findings in similar studies, on different data, by Ermisch and Francesconi (2001) and Ruhm (2001), though there is some difference in the emphasis accorded to the emergence of a negative finding.

I prefer ‘mother who does paid work’. All mothers work, not just those some of whose work is paid.